

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 29 June 2001 (29.06.01)	
International application No. PCT/EP00/09452	Applicant's or agent's file reference PD990070
International filing date (day/month/year) 27 September 2000 (27.09.00)	Priority date (day/month/year) 29 September 1999 (29.09.99)
Applicant WEITBRUCH, Sébastien et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

19 April 2001 (19.04.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Lazar Joseph Panakal Telephone No.: (41-22) 338.83.38
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PCT

From the INTERNATIONAL BUREAU

**NOTIFICATION OF THE RECORDING
OF A CHANGE**

(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

HARTNACK, Wolfgang
Deutsche Thomson-Brandt GmbH
European Patent Operations
Karl-Wiechert-Allee 74
30625 Hannover
ALLEMAGNE

Date of mailing (day/month/year) 25 October 2001 (25.10.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference PD990070	
International application No. PCT/EP00/09452	International filing date (day/month/year) 27 September 2000 (27.09.00)

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address DEUTSCHE THOMSON-BRANDT GMBH Hermann-Schwer-Str. 3 78048 Villingen-Schwenningen Germany	State of Nationality DE	State of Residence DE
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person ☐ the name ☐ the address ☐ the nationality ☐ the residence

Name and Address THOMSON LICENSING S.A. 46, Quai A. Le Gallo F-92100 Boulogne-Billancourt France	State of Nationality FR	State of Residence FR
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:
Assignment.

4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned
☐ the International Searching Authority ☒ the elected Offices concerned
☒ the International Preliminary Examining Authority ☐ other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Elisabeth KÖNIG Telephone No.: (41-22) 338.83.38
---	---

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference PD990070	FOR FURTHER ACTION		see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/EP 00/ 09452	International filing date (day/month/year) 27/09/2000	(Earliest) Priority Date (day/month/year) 29/09/1999	
Applicant DEUTSCHE THOMSON-BRANDT GMBH			

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

DATA PROCESSING METHOD AND APPARATUS FOR A DISPLAY DEVICE

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

14

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/09452

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G09G3/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 G09G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 840 274 A (FUJITSU LTD.) 6 May 1998 (1998-05-06)	1,2,5,8
A	page 15, line 34 -page 20, line 10; figures 41-60; tables 4,5 ---	3,4,6,7
A	EP 0 720 139 A (PIONEER ELECTRONIC CORP.) 3 July 1996 (1996-07-03) abstract page 3, line 12 - line 19 page 4, line 24 -page 6, line 20; figures 2-4; table 1 ---	1-8
A	EP 0 893 916 A (FUJITSU LTD.) 27 January 1999 (1999-01-27) abstract column 7, line 24 - line 30; figure 1 -----	1-8

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

5 February 2001

Date of mailing of the international search report

12/02/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

O'Reilly, D

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/09452

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 840274	A	06-05-1998	JP	10133623 A	22-05-1998
<hr/>					
EP 720139	A	03-07-1996	JP	8234694 A	13-09-1996
			JP	9102921 A	15-04-1997
			US	6025818 A	15-02-2000
<hr/>					
EP 893916	A	27-01-1999	JP	11231827 A	27-08-1999
			JP	11212517 A	06-08-1999
<hr/>					

FORM PTO-1390 (Modified)
(REV 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

PD

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.5)

10/089361INTERNATIONAL APPLICATION NO.
PCT/EP00/09452INTERNATIONAL FILING DATE
27 September 2000 (27.09.00)PRIORITY DATE CLAIMED
29 September 1999 (29.09.99)

TITLE OF INVENTION

DATA PROCESSING METHOD AND APPARATUS FOR A DISPLAY DEVICE

APPLICANT(S) FOR DO/EO/US

Sebastien Weitbruch, Carlos Correa and Rainer Zwing

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☐ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A copy of the International Search Report (PCT/ISA/210).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☒ Certificate of Mailing by Express Mail.
23. ☒ Other items or information:

Return Postcard Receipt and a copy of PCT/IB/306**EXPRESS MAIL LABEL No. EV 025962852US****DATE: March 26, 2002**

10/0893

PCT/EP00/09452

PD990070

The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00
- ☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00
- ☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =**CALCULATIONS PTO USE ONLY**

\$890.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

\$0.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	9 - 20 =	0	x \$18.00
Independent claims	2 - 3 =	0	x \$84.00

\$0.00

\$0.00

Multiple Dependent Claims (check if applicable) ☐

\$0.00

TOTAL OF ABOVE CALCULATIONS =

\$890.00

☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.

\$0.00

SUBTOTAL =

\$890.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).

\$0.00

TOTAL NATIONAL FEE =

\$890.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).

☒

\$40.00

TOTAL FEES ENCLOSED =

\$930.00

Amount to be:
refunded \$
charged \$

- ☐ A check in the amount of _____ to cover the above fees is enclosed.
- ☒ Please charge my Deposit Account No. 07-0832 in the amount of \$930.00 to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 07-0832. A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Mr. Joseph S. Tripoli
Patent Operations
THOMSON multimedia Licensing Inc.
PO Box 5312
Princeton, New Jersey 08540 US

SIGNATURE

SAMMY S. HENIG

NAME

30,263

REGISTRATION NUMBER

March 26, 2002

DATE

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/JP00/09452

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G09G3/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G09G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 840 274 A (FUJITSU LTD.) 6 May 1998 (1998-05-06)	1,2,5,8
A	page 15, line 34 -page 20, line 10; figures 41-60; tables 4,5	3,4,6,7
A	EP 0 720 139 A (PIONEER ELECTRONIC CORP.) 3 July 1996 (1996-07-03) abstract page 3, line 12 - line 19 page 4, line 24 -page 6, line 20; figures 2-4; table 1	1-8
A	EP 0 893 916 A (FUJITSU LTD.) 27 January 1999 (1999-01-27) abstract column 7, line 24 - line 30; figure 1	1-8

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

S document member of the same patent family

Date of the actual completion of the international search

5 February 2001

Date of mailing of the international search report

12/02/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx. 31 651 epo nl
Fax (+31-70) 340-3016

Authorized officer

O'Reilly, D

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PC 00/09452

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 840274	A	06-05-1998	JP 10133623 A	22-05-1998
EP 720139	A	03-07-1996	JP 8234694 A	13-09-1996
			JP 9102921 A	15-04-1997
			US 6025818 A	15-02-2000
EP 893916	A	27-01-1999	JP 11231827 A	27-08-1999
			JP 11212517 A	06-08-1999

PATENT COOPERATION TREATY

EXPRESS EV 025 2852 US

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis:1 and
Administrative Instructions, Section 422)

Date of mailing (day/month/year) 25 October 2001 (25.10.01)	To: HARTNACK, Wolfgang Deutsche Thomson-Brandt GmbH European Patent Operations Karl-Wiechert-Allee 7 30626 Hannover ALLEMAGNE 6.11.	THOMSON multimedia RECEIVED 1405. Nov. 2001
Applicant's or agent's file reference PD990070	IMPORTANT NOTIFICATION	
International application No. PCT/EP00/09452	International filing date (day/month/year) 27 September 2000 (27.09.00)	

1. The following indications appeared on record concerning:

☒ the applicant
 ☐ the inventor
 ☐ the agent
 ☐ the common representative

Name and Address

 DEUTSCHE THOMSON-BRANDT GMBH
 Hermann-Schwer-Str. 3
 78048 Villingen-Schwenningen
 Germany

State of Nationality

DE

State of Residence

DE

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person
 ☐ the name
 ☐ the address
 ☐ the nationality
 ☐ the residence

Name and Address

 THOMSON LICENSING S.A.
 46, Quai A. Le Gallo
 F-92100 Boulogne-Billancourt
 France

State of Nationality

FR

State of Residence

FR

Telephone No.

Facsimile No.

Teleprinter No.

3. Further observations, if necessary:
Assignment.

4. A copy of this notification has been sent to:

☒ the receiving Office
 ☐ the International Searching Authority
 ☒ the International Preliminary Examining Authority
 ☐ the designated Offices concerned
 ☒ the elected Offices concerned
 ☐ other:

 The International Bureau of WIPO
 34, chemin des Colombettes
 1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Elisabeth Kottig

Telephone No.: (41-22) 338.83.38

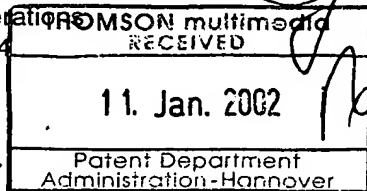
PATENT COOPERATION TREATY

EXPRESS EV02592852US

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

SCHÄFERJOHANN, Volker
DEUTSCHE THOMSON-BRANDT GMBH
European Patent Office
Karl-Wiechert-Allee 74
D-30625 Hannover
ALLEMAGNE



PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 08.01.2002

Applicant's or agent's file reference
PD990070

IMPORTANT NOTIFICATION

International application No.
PCT/EP00/09452

International filing date (day/month/year)
27/09/2000

Priority date (day/month/year)
29/09/1999

Applicant
THOMSON LICENSING S.A.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

 European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Thomas, R
Tel. +49 89 2399-2247



26 MAR 2002

1.3.99 PCT/IB/301

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PD990070	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/09452	International filing date (day/month/year) 27/09/2000	Priority date (day/month/year) 29/09/1999
International Patent Classification (IPC) or national classification and IPC G09G3/28		
Applicant THOMSON LICENSING S.A.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 13 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 19/04/2001	Date of completion of this report 08.01.2002
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized officer Morris, D Telephone No. +49 89 2399 2182



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/09452

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-22 as originally filed

Claims, No.:

1-9 as received on 24/11/2001 with letter of 21/11/2001

Drawings, sheets:

1/12-12/12 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/09452

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
☐ paid additional fees.
☐ paid additional fees under protest.
☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-9
	No: Claims
Inventive step (IS)	Yes: Claims 3-6, 9
	No: Claims 1-2, 7-8

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/09452

Industrial applicability (IA) Yes: Claims 1-9
 No: Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item IV

Lack of unity of invention

1.1 Reference is made to the following documents:

D1: EP-A-0 720 139 (PIONEER ELECTRONIC CORP.) 3 July 1996
(03.07.1996)

D2: EP-A-0 893 916 (FUJITSU LTD.) 27 January 1999 (27.01.1999)

D3: WO 9930310 A (MATSUSHITA) 17 June 1999 (17.06.1999)

2.1 It is noted that the respective subject matters of:

- the methods of present independent claim 1 and 3, comprise three different inventions (- see also "Alternative forms [...] in a single claim" of PCT Guidelines III-7.4), i.e. with each of the said invention comprising the common features of:

- all of the features of lines 1-13 of each of present independent claims 1 and 3;

- the step of

- "[calculating a motion vector] separately for one or more colour components of a pixel wherein, for the motion calculation, the sub-field code words are used as data input instead of the video signal samples colour component" (- lines 13-18 of present independent claims 1 and 3)

- "the motion vector" being defined as a trajectory along which corrected code words will be placed (- see last 2 lines of present claim 1, and being considered implicit for present independent claim 3),

2.1a with the first alternative invention of present independent claim 1 comprising the additional feature of:

- "the motion vector calculation is done based on the complete sub-field code words" (- lines 18-20);

2.1b with the second alternative invention of present independent claim 1 comprising the additional feature of (- i.e. after conjunction "or" of present claim 1, line 20):

- "[the motion calculation is done] based on code words that are formed from the entries in the subfield code words of only a sub-group of sub-fields from the plurality of subfields" (- present claim 1, lines 20-22); and

2.1c with the third invention of present independent claim 3 comprising the additional feature of:

a motion vector calculation is done based on a single bit picture, wherein each pixel of the single bit picture is equal to a dedicated entry of the corresponding sub-field code word for that pixel, namely [...]" (- present claim 3, lines 17-26).

2.2 However, the first and second inventions are not considered to comprise an inventive step (- Article 33(3) PCT) over what is considered an obvious combination of the teachings of D1 and D2.

2.3 As such the three inventions of independent claim 1 are therefore considered to lack a "single general inventive concept" by which the group of inventions of independent claim 1 may be linked, in contravention of Rule 13 PCT and PCT Guidelines C-III, 7.1.

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 3.1 D2 discloses (- cf. the preamble of present independent claim 1) an apparatus for processing video pictures for display on a display device (- "plasma display panel" - column 1, lines 6-9) having a plurality of luminous elements corresponding to pixels of a picture, wherein:

the time duration of a video frame or video field is divided into a plurality of sub-fields (- Fig. 9) during which the luminous elements can be activated for light emission in pulses corresponding to a sub-field code word (- Figs. 3a-6b) which is used for brightness control;

to each subfield is assigned a specific sub-field weight (- "luminance weights" - Fig. 9);

motion vectors are used to determine corrected sub-field code words for pixels (- "Motion Vector" [- fourth embodiment of D2] - Figs. 19 and 25).

- 3.1a D2 further discloses a motion vector calculation is made separately for one or more colour components of a pixel

(- "the technique of the present embodiment can also be applied to the processing of each color in PDPs for color display which generate pixels using the three colors red (R), green (G), and blue (B)" [- first embodiment of D2] - column 7, lines 22-24).

- 3.2 The subject matter of claim 1 is distinguished from the disclosure of D2 in that D2 does not disclose how the motion vectors are calculated.

- 3.2a However, the step per se of calculating motion vectors separately for a group of subfields from the plurality of subfields is known from at least D1

(- i.e. see 100*****->011***** of change detection circuit 22 - Fig. 10; and also "As shown by the dash-dot lines and dash-two-dot lines in Figs. 10 and 11, there are further provided two other inter-frame change detecting circuits which determine the changes of values of the second and third highest order bits," - page 7, lines 30-31 of D1).

3.2b It is further noted in this respect that D1, in common with D2, also discloses corresponding features of (- cf. lines 1-14 of independent claim 1):

- (- "plasma display panel" - page 2, lines 5-6)
- (- D1-D8 - Fig. 5)
- (- Pixel Data - Fig. 22c)
- (- Fig. 22b)
- (- Changing speed detecting circuit 23" - Figs. 10 and 12a-12b together with
"The present pixel may be compared with four pixel disposed above,
below, right and left thereof [- cf. Fig. 12b]. [...] Furthermore, a
movement detecting circuit for detecting the direction of the movement
may be provided" - page 8, lines 18-22).

The disclosure of D1 differs from the subject matter of the second alternative of independent claim 1 in that whereas the subject matter of claim 1 is directed to a plasma display panel having a plurality of colours, the disclosure of D1 is directed to that of a display having only a single colour display (- "in a single tone display" page 2, lines 29-30) in which respective RGB video signals have been converted to a single digital pixel data (- "each pixel data [...] is an 8-bit pixel data" - page 4, lines 3-5 of D1).

3.3 As such the subject matter of independent claim 1 subsequently appears to comprise nothing more than the association of known processes, i.e.

- a step of determining corrected sub-field code words for dynamic false contour compensation (- "moving image false edge" - Abstract, left column, lines 2-3 and Fig. 21 of D2) separately for each colour of D1 for a colour plasma display panel, said determination being based on previously, independently determined, motion vectors; and
- a step of determining a motion vector for a single colour for use in dynamic false contour compensation (- "preventing false contouring" - page 2, lines 5-6 of D1), said motion vector determination being considered independent of the correction value which is subsequently applied to pixel data,

said two processes functioning in their normal way and not producing any non-obvious working relationship (- PCT Guidelines IV-8.8 A2). Subsequently, the

subject matter of independent claim 1 (- in respect of the second alternative) is not considered to involve an inventive step (- Article 33(3) PCT) over a non-inventive combination of the respective teachings of D1 and D2.

3.4 Furthermore, insofar as:

- D1 also discloses comparing the complete sub-field code words (- 8-bit data "A" - Fig. 10) against a value "10000000" comprising 8- bits (- 25 - Fig. 10), i.e. for use in determining (- via 26 - Fig. 10) whether or not to apply a correction to the data (- G - Fig. 10) from a compensation block (24 - Fig. 10); and
- D1 discloses the use of sub-field code words which use a binary progression (- e.g. see Fig. 9),

D1 is also considered to disclose:

"the motion vector calculation is done based on the complete sub-field code words and the sub-field code words being interpreted as standard binary numbers" (- i.e. see lines of independent claim 1).

Subsequently, the first alternative of the subject matter of present claim 1, so far as understood, is also not considered to comprise an inventive step over a non-inventive combination of D1 and D2 within the meaning of Article 33(3) PCT.

3.5 D1 further discloses (- cf. dependent claims 2, 7 and 8):

- a gradient determination step (- "means for detecting the decrease of the luminance comprising [exclusive OR gates 22f, 22h]" - page 7, lines 22-27; - cf. dependent claim 2);
- sub-field entry shifts (- in e.g. "A1" of "corrected pixel data of frame n" of Fig. 3 of D1, the left most "1" of e.g. original pixel sub-field data "01111111" is shifted in position once to the left, and each of the other "1"s of the original data are shifted in position once to the right to produce the corrected data "10011111" - Fig. 3 of D1; - cf. present dependent claim 7); and
- using the method in a plasma display device for dynamic false contour compensation (- "plasma display panel [...] preventing false contouring"

- page 2, lines 5-6; - cf. dependent claim 8).

Accordingly, so far as understood, the respective subject matters of dependent claims 2, 7 and 8 are also not considered to comprise an inventive step over a non-inventive combination of D1 and D2 within the meaning of Article 33(3) PCT.

- 3.6 Non of the available prior art either discloses or suggests a method for processing video pictures along the lines of that claimed in present independent claim 3.

Accordingly the subject matter of present independent claim 3 is considered to meet the requirement of novelty of Article 33(2) PCT.

- 3.6a Nor is the subject matter of present independent claim 3 considered to be anticipated by any combination of available prior art documents.

Accordingly the subject matter of present independent claim 3 is considered to meet the requirement of inventive step of Article 33(3) PCT.

- 3.7 Likewise dependent claims 4-6 and 9, all dependent on claim 3, are also considered to meet the requirements of Articles 33(2)(3) PCT in respect of novelty and inventive step.

Re Item VII

Certain defects in the international application

- 4.1 D1 does not form the preamble of any Independent claim 1 (Rule 6.3(b)(i) PCT).
- 4.2 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 are not mentioned in the description, nor are these documents identified therein.
- 4.2a In addition, insofar as D3 discloses (- cf. present independent claim 3):
- motion estimation vectors are used to determine corrected sub-field code words for pixels (- "when pixel comparison is performed for a pixel that is located within 3 pixels of a pixel of interest in a certain direction, [...] then the value obtained by adding the results thereof can be treated as the MPD value in that direction" - page 58, lines 3-9, it being noted that insofar as the MPD value obtained comprises both magnitude and direction, said MPD value is considered to be a vector);
 - the vector calculation is made separately for one or more colour components of a pixel (- RGB input to "MPD detector 60" - Fig. 21, i.e. it being implicit in this respect that the motion vector calculations are carried out separately for each colour);
 - sub-field code words are used as data input (- SF1-SF4 - Figs. 23A-23C);
 - and
 - the vector calculation is done based on the complete sub-field code words (- EX-OR calculations of Figs. 23A-24C; - cf also "sum of the sub-field weights [...] which have different binary entries" of dependent claim 2 and see also Figs. 12 and 13 of the present application,
- mention of D3 should also be made in the description (- Rule 5.1(a)(ii) PCT).

Re Item VIII

Certain observations on the international application

5. The following objections are made within the meaning of Article 6 PCT with respect clarity and conciseness.
 - 5.1 Insofar as the wording of present independent claim 9 fails to mention features essential for implementing the steps of the method of claim 3, the subject matter of independent claim 9 is considered to lack features considered essential for the performance of the invention (- Article 6 PCT; Guidelines III-4.3).
 - 5.1a In addition, the scope of the subject matter of independent claim 9 for which protection is sought is considered obscure as, from the use of the term "characterised in that", it appears that an apparatus comprising all the features essential for implementing the method of independent claim 3 should be considered part of the prior art (- Rule 6.3(b)(i)(ii) PCT).
 - 5.2 The subject matter of independent claim 3, insofar as the wording of the claims fails to indicate the basis upon which the "single bit" of the "single bit picture", the subject matter of said independent is considered to lack features considered essential for the performance of the invention. It noted in this respect that, as acknowledged in the description (- see e.g. Fig. 18), not all "single bits" may be considered suitable for calculating a motion vector, leading to an inconsistency between the claims and the description (- Guidelines III-4.3).
 - 5.3 Insofar as claim 8 claims the "[the method] is used in a plasma display device", it is not clear whether the subject matter claimed comprises:
 - i) the use of a method, by which the subject matter of claim 8 effectively comprises the same subject matter as that of the method of claim 1 to 7 (- conciseness; Article 6 PCT); or
 - ii) a plasma display device comprising respective means for carrying out each step of the methods of claims 1 to 7.

- 5.4 In respect of the sentences of page 12, lines 17-19 of the application as originally filed and of page 20, lines 25-28, insofar as the wording of each said sentence appears to seek to incorporate subject matter of the disclosure "EP-A-0 980 059" into the description, the applicant is reminded that insofar as said disclosure may relate directly to the disclosure of the invention (- e.g. see "sub-field entry shifts are calculated" of dependent claim 3), that if matter in said document is essential to satisfy the requirements of Article 5 PCT, this matter should be incorporated in the description (- PCT Guidelines II-4.17; Article 5 PCT).

Claims

1. Method for processing video pictures for display on a display device having a plurality of luminous elements corresponding to the pixels of a picture, wherein the time duration of a video frame or video field is divided into a plurality of sub-fields (SF) during which the luminous elements can be activated for light emission in small pulses corresponding to a sub-field code word which is used for brightness control, wherein to each sub-field a specific sub-field weight is assigned, wherein with motion estimation motion vectors are calculated for pixels in a video picture, and these motion vectors are used to determine corrected sub-field code words for pixels, characterized in that, a motion vector calculation is being made separately for one or more colour component (R,G,B) of a pixel, wherein for the motion vector calculation the sub-field code words are used as data input instead of the video signal samples for a colour component, and wherein the motion vector calculation is done based on the complete sub-field code words or based on code words that are formed from the entries in the sub-field code words of only a sub-group of sub-fields from the plurality of sub-fields and the motion vector defines a trajectory along which corrected sub-field code words will be placed.
2. Method according to claim 1, wherein for the case that a motion vector calculation is done based on the complete sub-field code words or for a sub-group of sub-fields, a gradient determination step is performed for comparing pixels in two successive frames, with the gradient between two pixels being defined as the sum of the sub-field weights of those sub-fields of the sub-field code

words or sub-groups of the sub-field code words which have different binary entries.

3. Method for processing video pictures for display on a display device having a plurality of luminous elements corresponding to the pixels of a picture, wherein the time duration of a video frame or video field is divided into a plurality of sub-fields (SF) during which the luminous elements can be activated for light emission in small pulses corresponding to a sub-field code word which is used for brightness control, wherein to each sub-field a specific sub-field weight is assigned, wherein motion vectors are calculated for pixels in a video picture, and these motion vectors are used to determine corrected sub-field code words for pixels, characterized in that, a motion vector calculation is being made separately for one or more colour component (R,G,B) of a pixel, and for the motion vector calculation the sub-field code words are used as data input instead of the video signal samples for a colour component, and wherein a motion vector calculation is done based on a single bit picture, wherein each pixel of the single bit picture is equal to a dedicated entry of the corresponding sub-field code word for that pixel, namely the entry for a dedicated single sub-field from the plurality of sub-fields.
4. Method according to claim 3, wherein the resulting motion vector calculated based on a single bit picture is used to calculate corrected sub-field code word entries for only the sub-field based on which the motion vector calculation has been made.

5. Method according to claim 3 or 4, wherein motion vectors are calculated separately for those sub-fields having the higher sub-field weights.
- 5 6. Method according to claim 3 or 5, wherein the resulting motion vectors calculated from single bit pictures for a pixel are averaged and the averaged motion vector is used to calculate corrected sub-field code word entries for the sub-field code words.
- 10 7. Method according to one of claims 1 to 6, wherein for the determination of corrected sub-field code words sub-field entry shifts are calculated for a given pixel based on the calculated motion vector and wherein the
- 15 sub-field entry shifts determine which sub-field entry in the sub-field code word of a given pixel need to be shifted to which pixel position along the direction of the motion vector.
- 20 8. Method according to one of claims 1 to 7, wherein it is used in a plasma display device for dynamic false contour compensation.
- 25 9. Apparatus for performing the method of claim 3, having a sub-field coding unit for each colour component video data, characterized in that, the apparatus further has motion estimators for each colour component and the motion estimators are sub-divided in a plurality of single bit motion estimators (ME) which receive as input
- 30 data the single bit pixels from the sub-field code words for performing motion estimation separately for a single sub-field and that the apparatus has a corresponding plurality of compensation blocks (dFCC) for calculating corrected sub-field code word entries.

PCT

REC'D 11 JAN 2002

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PD990070	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP00/09452	International filing date (day/month/year) 27/09/2000	Priority date (day/month/year) 29/09/1999
International Patent Classification (IPC) or national classification and IPC G09G3/28		
Applicant THOMSON LICENSING S.A.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 13 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 19/04/2001	Date of completion of this report 08.01.2002
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Morris, D Telephone No. +49 89 2399 2182



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/09452

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-22 as originally filed

Claims, No.:

1-9 as received on 24/11/2001 with letter of 21/11/2001

Drawings, sheets:

1/12-12/12 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/09452

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
☐ paid additional fees.
☐ paid additional fees under protest.
☒ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-9
	No: Claims
Inventive step (IS)	Yes: Claims 3-6, 9
	No: Claims 1-2, 7-8

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/09452

Industrial applicability (IA) Yes: Claims 1-9
 No: Claims

2. Citations and explanations
 see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/09452

Re Item IV

Lack of unity of invention

1.1 Reference is made to the following documents:

- D1: EP-A-0 720 139 (PIONEER ELECTRONIC CORP.) 3 July 1996
(03.07.1996)
- D2: EP-A-0 893 916 (FUJITSU LTD.) 27 January 1999 (27.01.1999)
- D3: WO 9930310 A (MATSUSHITA) 17 June 1999 (17.06.1999)

2.1 It is noted that the respective subject matters of:

- the methods of present independent claim 1 and 3, comprise three different inventions (- see also "Alternative forms [...] in a single claim" of PCT Guidelines III-7.4), i.e. with each of the said invention comprising the common features of:
 - all of the features of lines 1-13 of each of present independent claims 1 and 3;
- the step of
 - "[calculating a motion vector] separately for one or more colour components of a pixel wherein, for the motion calculation, the sub-field code words are used as data input instead of the video signal samples for a colour component" (- lines 13-18 of present independent claims 1 and 3); and
- the "motion vector" being defined as a trajectory along which corrected sub-field code words will be placed (- see last 2 lines of present claim 1, and being considered implicit for present independent claim 3),

2.1a with the first alternative invention of present independent claim 1 comprising the additional feature of:

- "the motion vector calculation is done based on the complete sub-field code words" (- lines 18-20);

2.1b with the second alternative invention of present independent claim 1 comprising the additional feature of (- i.e. after conjunction "or" of present claim 1, line 20):

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/09452

- "[the motion calculation is done] based on code words that are formed from the entries in the subfield code words of only a sub-group of sub-fields from the plurality of subfields" (- present claim 1, lines 20-22); and

2.1c with the third invention of present independent claim 3 comprising the additional feature of:

a motion vector calculation is done based on a single bit picture, wherein each pixel of the single bit picture is equal to a dedicated entry of the corresponding sub-field code word for that pixel, namely [...]" (- present claim 3, lines 17-26).

2.2 However, the first and second inventions are not considered to comprise an inventive step (- Article 33(3) PCT) over what is considered an obvious combination of the teachings of D1 and D2.

2.3 As such the three inventions of independent claim 1 are therefore considered to lack a "single general inventive concept" by which the group of inventions of independent claim 1 may be linked, in contravention of Rule 13 PCT and PCT Guidelines C-III, 7.1.

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 3.1 D2 discloses (- cf. the preamble of present independent claim 1) an apparatus for processing video pictures for display on a display device (- "plasma display panel" - column 1, lines 6-9) having a plurality of luminous elements corresponding to pixels of a picture, wherein:

the time duration of a video frame or video field is divided into a plurality of sub-fields (- Fig. 9) during which the luminous elements can be activated for light emission in pulses corresponding to a sub-field code word (- Figs. 3a-6b) which is used for brightness control;

to each subfield is assigned a specific sub-field weight (- "luminance weights" - Fig. 9);

motion vectors are used to determine corrected sub-field code words for pixels (- "Motion Vector" [- fourth embodiment of D2] - Figs. 19 and 25).

- 3.1a D2 further discloses a motion vector calculation is made separately for one or more colour components of a pixel

(- "the technique of the present embodiment can also be applied to the processing of each color in PDPs for color display which generate pixels using the three colors red (R), green (G), and blue (B)" [- first embodiment of D2] - column 7, lines 22-24).

- 3.2 The subject matter of claim 1 is distinguished from the disclosure of D2 in that D2 does not disclose how the motion vectors are calculated.

- 3.2a However, the step per se of calculating motion vectors separately for a group of subfields from the plurality of subfields is known from at least D1

(- i.e. see 100*****->011***** of change detection circuit 22 - Fig. 10; and also "As shown by the dash-dot lines and dash-two-dot lines in Figs. 10 and 11, there are further provided two other inter-frame change detecting circuits which determine the changes of values of the second and third highest order bits," - page 7, lines 30-31 of D1).

3.2b It is further noted in this respect that D1, in common with D2, also discloses corresponding features of (- cf. lines 1-14 of independent claim 1):

- (- "plasma display panel" - page 2, lines 5-6)
- (- D1-D8 - Fig. 5)
- (- Pixel Data - Fig. 22c)
- (- Fig. 22b)
- (- Changing speed detecting circuit 23" - Figs. 10 and 12a-12b together with "The present pixel may be compared with four pixel disposed above, below, right and left thereof [- cf. Fig. 12b]. [...] Furthermore, a movement detecting circuit for detecting the direction of the movement may be provided" - page 8, lines 18-22).

The disclosure of D1 differs from the subject matter of the second alternative of independent claim 1 in that whereas the subject matter of claim 1 is directed to a plasma display panel having a plurality of colours, the disclosure of D1 is directed to that of a display having only a single colour display (- "in a single tone display" page 2, lines 29-30) in which respective RGB video signals have been converted to a single digital pixel data (- "each pixel data [...] is an 8-bit pixel data " - page 4, lines 3-5 of D1).

3.3 As such the subject matter of independent claim 1 subsequently appears to comprise nothing more than the association of known processes, i.e.

- a step of determining corrected sub-field code words for dynamic false contour compensation (- "moving image false edge" - Abstract, left column, lines 2-3 and Fig. 21 of D2) separately for each colour of D1 for a colour plasma display panel, said determination being based on previously, independently determined, motion vectors; and
- a step of determining a motion vector for a single colour for use in dynamic false contour compensation (- "preventing false contouring" - page 2, lines 5-6 of D1), said motion vector determination being considered independent of the correction value which is subsequently applied to pixel data,

said two processes functioning in their normal way and not producing any non-obvious working relationship (- PCT Guidelines IV-8.8 A2). Subsequently, the

subject matter of independent claim 1 (- in respect of the second alternative) is not considered to involve an inventive step (- Article 33(3) PCT) over a non-inventive combination of the respective teachings of D1 and D2.

3.4 Furthermore, insofar as:

- D1 also discloses comparing the complete sub-field code words (- 8-bit data "A" - Fig. 10) against a value "10000000" comprising 8- bits (- 25 - Fig. 10), i.e. for use in determining (- via 26 - Fig. 10) whether or not to apply a correction to the data (- G - Fig. 10) from a compensation block (24 - Fig. 10); and
- D1 discloses the use of sub-field code words which use a binary progression (- e.g. see Fig. 9),

D1 is also considered to disclose:

"the motion vector calculation is done based on the complete sub-field code words and the sub-field code words being interpreted as standard binary numbers" (- i.e. see lines of independent claim 1).

Subsequently, the first alternative of the subject matter of present claim 1, so far as understood, is also not considered to comprise an inventive step over a non-inventive combination of D1 and D2 within the meaning of Article 33(3) PCT.

3.5 D1 further discloses (- cf. dependent claims 2, 7 and 8):

- a gradient determination step (- "means for detecting the decrease of the luminance comprising [exclusive OR gates 22f, 22h]" - page 7, lines 22-27; - cf. dependent claim 2);
- sub-field entry shifts (- in e.g. "A1" of "corrected pixel data of frame n" of Fig. 3 of D1, the left most "1" of e.g. original pixel sub-field data "01111111" is shifted in position once to the left, and each of the other "1"s of the original data are shifted in position once to the right to produce the corrected data "10011111" - Fig. 3 of D1; - cf. present dependent claim 7); and
- using the method in a plasma display device for dynamic false contour compensation (- "plasma display panel [...] preventing false contouring"

- page 2, lines 5-6; - cf. dependent claim 8).

Accordingly, so far as understood, the respective subject matters of dependent claims 2, 7 and 8 are also not considered to comprise an inventive step over a non-inventive combination of D1 and D2 within the meaning of Article 33(3) PCT.

- 3.6 Non of the available prior art either discloses or suggests a method for processing video pictures along the lines of that claimed in present independent claim 3.

Accordingly the subject matter of present independent claim 3 is considered to meet the requirement of novelty of Article 33(2) PCT.

- 3.6a Nor is the subject matter of present independent claim 3 considered to be anticipated by any combination of available prior art documents.

Accordingly the subject matter of present independent claim 3 is considered to meet the requirement of inventive step of Article 33(3) PCT.

- 3.7 Likewise dependent claims 4-6 and 9, all dependent on claim 3, are also considered to meet the requirements of Articles 33(2)(3) PCT in respect of novelty and inventive step.

Re Item VII

Certain defects in the international application

- 4.1 D1 does not form the preamble of any Independent claim 1 (Rule 6.3(b)(i) PCT).
- 4.2 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 are not mentioned in the description, nor are these documents identified therein.
- 4.2a In addition, insofar as D3 discloses (- cf. present independent claim 3):
- motion estimation vectors are used to determine corrected sub-field code words for pixels (- "when pixel comparison is performed for a pixel that is located within 3 pixels of a pixel of interest in a certain direction, [...] then the value obtained by adding the results thereof can be treated as the MPD value in that direction" - page 58, lines 3-9, it being noted that insofar as the MPD value obtained comprises both magnitude and direction, said MPD value is considered to be a vector);
 - the vector calculation is made separately for one or more colour components of a pixel (- RGB input to "MPD detector 60" - Fig. 21, i.e. it being implicit in this respect that the motion vector calculations are carried out separately for each colour);
 - sub-field code words are used as data input (- SF1-SF4 - Figs. 23A-23C);
 - and
 - the vector calculation is done based on the complete sub-field code words (- EX-OR calculations of Figs. 23A-24C; - cf also "sum of the sub-field weights [...] which have different binary entries" of dependent claim 2 and see also Figs. 12 and 13 of the present application,
- mention of D3 should also be made in the description (- Rule 5.1(a)(ii) PCT).

Re Item VIII

Certain observations on the international application

5. The following objections are made within the meaning of Article 6 PCT with respect clarity and conciseness.
 - 5.1 Insofar as the wording of present independent claim 9 fails to mention features essential for implementing the steps of the method of claim 3, the subject matter of independent claim 9 is considered to lack features considered essential for the performance of the invention (- Article 6 PCT; Guidelines III-4.3).
 - 5.1a In addition, the scope of the subject matter of independent claim 9 for which protection is sought is considered obscure as, from the use of the term "characterised in that", it appears that an apparatus comprising all the features essential for implementing the method of independent claim 3 should be considered part of the prior art (- Rule 6.3(b)(i)(ii) PCT).
 - 5.2 The subject matter of independent claim 3, insofar as the wording of the claims fails to indicate the basis upon which the "single bit" of the "single bit picture", the subject matter of said independent is considered to lack features considered essential for the performance of the invention. It noted in this respect that, as acknowledged in the description (- see e.g. Fig. 18), not all "single bits" may be considered suitable for calculating a motion vector, leading to an inconsistency between the claims and the description (- Guidelines III-4.3).
 - 5.3 Insofar as claim 8 claims the "[the method] is used in a plasma display device", it is not clear whether the subject matter claimed comprises:
 - i) the use of a method, by which the subject matter of claim 8 effectively comprises the same subject matter as that of the method of claim 1 to 7 (- conciseness; Article 6 PCT); or
 - ii) a plasma display device comprising respective means for carrying out each step of the methods of claims 1 to 7.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP00/09452

- 5.4 In respect of the sentences of page 12, lines 17-19 of the application as originally filed and of page 20, lines 25-28, insofar as the wording of each said sentence appears to seek to incorporate subject matter of the disclosure "EP-A-0 980 059" into the description, the applicant is reminded that insofar as said disclosure may relate directly to the disclosure of the invention (- e.g. see "sub-field entry shifts are calculated" of dependent claim 3), that if matter in said document is essential to satisfy the requirements of Article 5 PCT, this matter should be incorporated in the description (- PCT Guidelines II-4.17; Article 5 PCT).

Claims

1. Method for processing video pictures for display on a display device having a plurality of luminous elements corresponding to the pixels of a picture, wherein the time duration of a video frame or video field is divided into a plurality of sub-fields (SF) during which the luminous elements can be activated for light emission in small pulses corresponding to a sub-field code word which is used for brightness control, wherein to each sub-field a specific sub-field weight is assigned, wherein motion vectors are calculated for pixels and these motion vectors are used to determine corrected sub-field code words for pixels, **characterized in that**, a motion vector calculation is being made separately for one or more colour component (R,G,B) of a pixel and wherein for the motion estimation the sub-field code words are used as data input, and wherein the motion vector calculation is done separately for single sub-fields or for a sub-group of sub-fields from the plurality of sub-fields, or wherein the motion vector calculation is done based on the complete sub-field code words and the sub-field code words being interpreted as standard binary numbers.
2. Method according to claim 1, wherein for the case that a motion vector calculation is done based on the complete sub-field code words or for a sub-group of sub-fields, a gradient determination step is performed for comparing pixels in two successive frames, with the gradient between two pixels being defined as the sum of the sub-field weights of those sub-fields of the sub-field code words or sub-groups of the sub-field code words which have different binary entries.

3. Method according to claim 1 or 2, wherein for the determination of corrected code words sub-field entry shifts are calculated for a given pixel based on the resulting motion vector and wherein the sub-field entry shifts determine which sub-field entry in the sub-field code word of a given pixel need to be shifted to which pixel position along the direction of the motion vector.
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4. Method according to claim 1, wherein in the case of determining motion vectors for single sub-fields of the sub-field code words motion vectors are calculated separately for those sub-fields having the higher sub-field weights.
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5. Apparatus for performing the method of claim 1, having a sub-field coding unit for each colour component video data, and corresponding compensation blocks (dFCC) for calculating corrected sub-field code words based on motion estimation data, **characterized in that**, the apparatus further has corresponding motion estimators (ME) for each colour component and that the motion estimators receive as input data the sub-field code words for the respective colour components.
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6. Apparatus for performing the method of claim 1, having a sub-field coding unit for each colour component video data, **characterized in that**, the apparatus further has motion estimators for each colour component and the motion estimators are sub-divided in a plurality of single bit motion estimators (ME) which receive as input data a single bit from the sub-field code words for performing motion estimation separately for single sub-fields and that the apparatus has a corresponding plurality of compensation blocks (dFCC) for calculating corrected sub-field code word entries.
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7. Apparatus for performing the method of claim 1, having a sub-field coding unit for each colour component video data, **characterized in that**, the apparatus further has motion estimators for each colour component and the mo-
5 tion estimators are single bit motion estimators which receive as input data a single bit from the sub-field code words for performing motion estimation separately for single sub-fields and that the apparatus has corresponding compensation blocks (dFCC) for calculating cor-
10 rected sub-field code word entries and wherein the motion estimators and compensation blocks are used repetitively during a frame period for the single sub-fields.
8. Use of the method according to one of the claims 1 to 4
15 in a plasma display device for dynamic false contour compensation.



— Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/ 0/09452

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G09G3/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G09G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 840 274 A (FUJITSU LTD.) 6 May 1998 (1998-05-06)	1,2,5,8
A	page 15, line 34 -page 20, line 10; figures 41-60; tables 4,5	3,4,6,7
A	EP 0 720 139 A (PIONEER ELECTRONIC CORP.) 3 July 1996 (1996-07-03) abstract page 3, line 12 - line 19 page 4, line 24 -page 6, line 20; figures 2-4; table 1	1-8
A	EP 0 893 916 A (FUJITSU LTD.) 27 January 1999 (1999-01-27) abstract column 7, line 24 - line 30; figure 1	1-8

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
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INTERNATIONAL SEARCH REPORT

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International Application No

PCT/00/09452

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